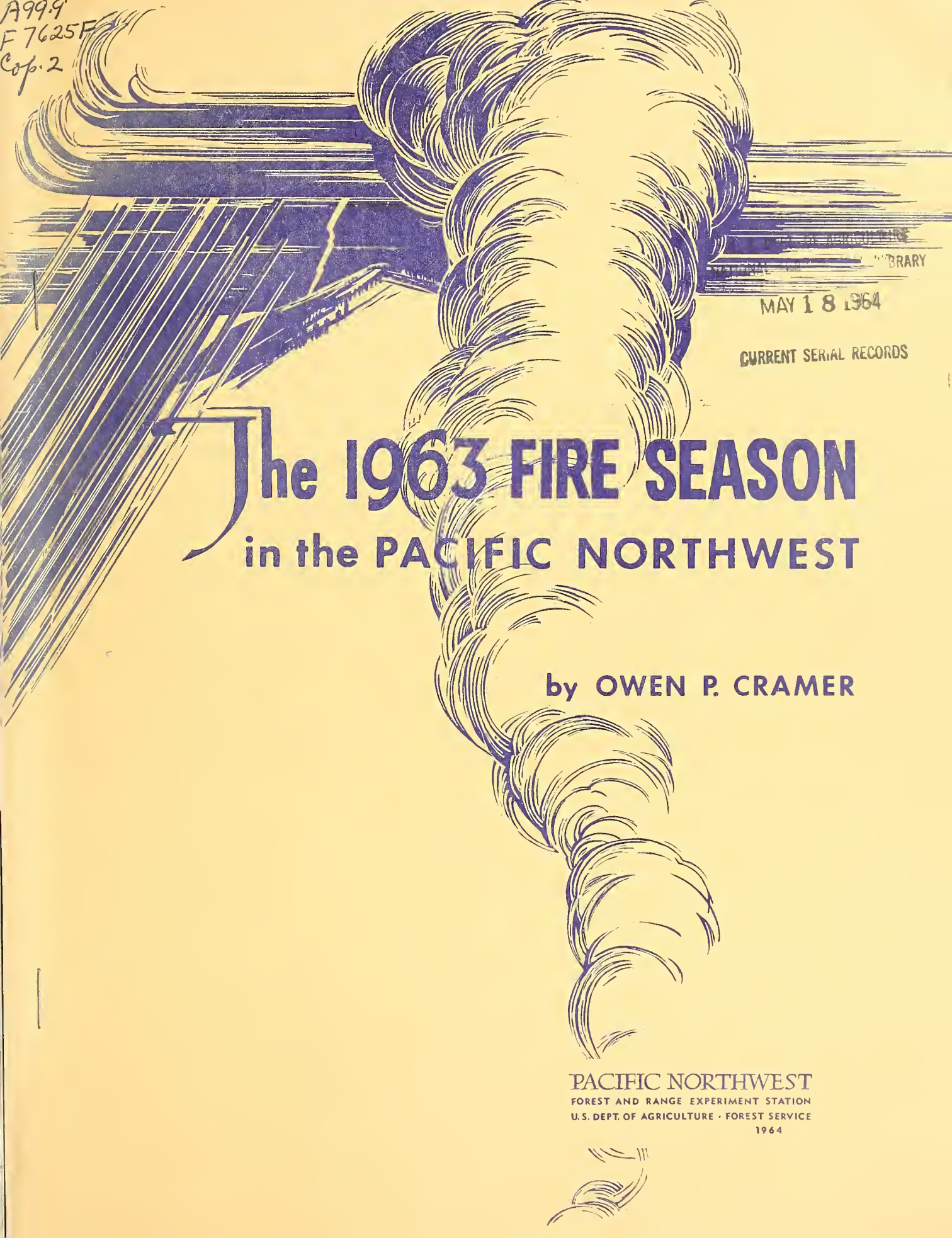


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The 1963 FIRE SEASON in the PACIFIC NORTHWEST

by OWEN P. CRAMER

PACIFIC NORTHWEST
FOREST AND RANGE EXPERIMENT STATION
U.S. DEPT. OF AGRICULTURE • FOREST SERVICE
1964

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SUMMARY

The 1963 fire season was one of the least severe in the last 20 years in western Washington and northwestern Oregon and was slightly below normal severity elsewhere in the two States. The season will be remembered for its wet, cold April; a May-June dry period west of the Cascades; a cold and cloudy July; an exceedingly warm September; and the most thunderstorm days in 14 years of record on 8 of the Region's 19 National Forests (fig. 1).

INTRODUCTION

Fire-Weather Indexes

Severity of weather conditions during the 1963 fire season is compared with that in previous years by the use of three indexes of weather conditions that are closely related to the ease with which fires start, the speed with which they spread, and the depth to which they burn. These weather indexes are: (1) total number of days when no rain fell, (2) average number of days since a wetting rain of one-fourth inch or more, and (3) burning index, a rating of the combined effect of fuel moisture and windspeed on fire occurrence and rate of fire spread. High burning index means high rate of spread. General severity of the season is judged by considering all three indexes.

Each index is an average of separate measurements from widely distributed Weather Bureau and Federal Aviation Agency stations and one Air Force station (table 4). These valley and mountain stations have provided an unbroken record both for the current year and many previous years, permitting valid comparisons of the present with the past. The number of years for which indexes have been computed varies from one section of the Region to another and is different for each index, varying from 14 years of thunderstorm data in all sections to 42 years of rainfall indexes for western Oregon, and at least 16 years of burning index wherever computed.

As in previous years, total rainless days and number of days since a wetting rain are both calculated for the entire April-through-October period for all sections of the Region. Burning index

computations are on a different basis than previously. The following changes have been made in procedure:

1. Burning index has been computed only for those areas for which existing stations provide a reasonably good indication of weather over forest areas.
2. For purposes of comparison, the new national spread index and the Region 6 index have both been computed.
3. The season for which burning index has been computed varies between areas to correspond to the portion of the year in which fires regularly occur.
4. The time of observation used in computing burning index has been changed from 1600 Pacific standard time to 1500 Pacific standard time.
5. The entire process of computing burning index has been converted to automatic data processing, and indexes have been computed for the years 1948~63 for each of the 10 stations. The delay in this report was caused by this conversion.

Regression equations of fire occurrence as a function of fire-season index have not yet been recomputed using the burning indexes for shortened seasons.

Both the Region 6 burning index and the national spread index agree on the identification of severe and easy years. They do not precisely agree, however, on the specific order, though there are no great differences. Some differences should be expected since the Region 6 index is a combination ignition and spread index whereas the national index is spread only.

OUTLINES OF FIRE-SEASON WEATHER BY SECTION

Western Washington

General. -- About equal to the easiest years of the past 28. Quite similar to 1954 and easier than 1948.

Rainfall indexes. -- Both indexes quite low and similar to 1948. Closeness of spacing of wetting rains second to 1948 (table 1).

Burning index (southwest Washington only). -- Only 1954 lower than 1963, with 1948 third in the past 20 years (table 2).

Thunderstorm days. -- Greatest number in 14 years (table 3).

General weather. -- April, cold and wet; July, cool, cloudy, and wet; September, hot with below normal rainfall; and October, warm and wet. Season rainy to May 6. Two predominantly rainless periods--28 days May-June and 31 days late July into August. Wetting rains well distributed throughout season.

Western Oregon

General. -- Particularly easy season northwest Oregon and slightly below normal severity southwest Oregon.

Rainfall indexes. -- Both indexes below normal but not as wet as 1947 and 1948. Summer similar to 1948.

Burning index. -- Northwest Oregon, lowest in 25 years though only slightly lower than 1954.

Southwest Oregon, normal severity--close to average of preceding 10 years.

Thunderstorm days. -- Number exceeded only in 1956.

General weather. -- April, cold and wet; May, wet; July, wet and cool; September, hot; other months, near normal. Rainy to May 11. Two predominantly rainless periods--early May to late June and early July to late August or mid-September. Season broken by wetting rains June 21-July 10, September 14-15, and in middle and late October.

East-Central Washington

General. -- Severity below normal.

Rainfall indexes. -- Season-long indexes similar to 1962 and slightly below normal. July 1-September 15 average time since wetting rain lowest since 1956 and total rainless days lowest since 1955.

Thunderstorm days. -- Greatest number in 14 years.

General weather. -- April and July, cool and wet; September, hot; and October, warm. Below normal rainfall for May, June, September, and October. Predominantly rainy to May 7, wetting rain July 7-8, few light rains in August, September, and October.

Northeast Oregon

General. -- Slightly below normal severity.

Rainfall indexes. -- Both indexes below normal and below 1962. Spring rainless days second fewest to 1948, and fall spacing of wetting rains second shortest to 1940. Summer about normal. Though Pendleton rainless days were near normal, most rains were less than one-quarter inch, resulting in spacing of summer wetting rains greatest in at least 25 years.

Burning index. -- Slightly below normal, but higher than 1962.

Thunderstorm days. -- Third greatest number in 14 years, exceeded slightly in 1956 and 1960.

General weather. -- April and July, cold and wet. Rainfall below normal in May, June, July, and October. May and October, slightly warmer than normal and September, hot with slightly above normal rainfall. Mostly rainy through May 15; occasional brief rainy periods in June; occasional rainy days in July and August; general rains September 12-15; and a few rainy days thereafter.

South-Central Oregon

General. -- Severity below normal.

Rainfall indexes. -- Season total rainless days fewest in at least 15 years, and time between wetting rains among the shortest in 15 years -- both well below 1962. Spring rainless days least in 15 years, and time since wetting rain third from shortest. Summer and fall rainless days near normal but with shorter-than-normal spacing of wetting rains.

Burning index (central Oregon only). -- Slightly below 10-year average and 1962.

Thunderstorm days. -- Second greatest number in 14 years, exceeded in 1956.

General weather. -- April, cold and wet; May, normal, June and July, cool with normal rainfall; August, normal; September, hot with above normal rain; and October, slightly warmer than normal and very dry. Rainfall plentiful through June with only occasional light rains thereafter until wetting rains late in October.

Table 1.--Rainfall indexes for the 1963 fire season^{1/} with comparative data for Oregon and Washington^{2/}

Station and index	Cur-	Pre-	10-year	Record before 1963 ^{3/}	
	rent	vious	average		
	year	year	average		
	(1963)	(1962)	(1953-62)	Low	High
Western Washington:					
Average days since wetting rain	7.6	10.9	11.7	7.0 (1948)	28.9 (1951)
Total rainless days	127.7	128.2	133.8	122.7 (1941)	162.3 (1938)
Western Oregon:					
Average days since wetting rain	19.2	19.3	22.8	13.5 (1941)	48.8 (1932)
Total rainless days	145.0	163.5	156.0	139.5 (1948)	176.0 (1952)
East-central Washington:					
Average days since wetting rain	42.0	37.6	47.0	14.7 (1948)	88.5 (1939)
Total rainless days	177.0	179.5	181.0	164.5 (1948)	197.0 (1949)
Northeastern Oregon:					
Average days since wetting rain	31.7	33.7	36.2	18.1 (1948)	53.6 (1949)
Total rainless days	165.4	179.0	176.1	153.6 (1948)	190.0 (1949)
South-central Oregon:					
Average days since wetting rain	27.7	38.8	36.6	24.2 (1952)	61.3 (1960)
Total rainless days	^{4/} 162.7	180.3	180.2	174.0 (1956)	190.7 (1949)

^{1/} April 1 through October 31.

^{2/} Indexes based on observations at certain Weather Bureau and FAA stations (see table 4).

^{3/} See table 4 for exact periods of record.

^{4/} New low record.

Table 2 -- Comparison of the national spread index and Region 6 burning index in rating the 1963 fire season for five areas^{1/} of Oregon and Washington

Area, index, and season	Cur- rent year :(1963)	Pre- vious year :(1962)	10-year average (1953-62)	Record before 1963 ^{2/}	
				Low	High
SW Washington (July 1 Sept. 15):					
Region 6 burning index	11.8	20.4	21.0	10.8 (1954)	29.0 (1951)
National spread index	29.7	35.4	38.6	26.2 (1954)	47.7 (1958)
NW Oregon (June 1-Sept. 30):					
Region 6 burning index	^{3/} 18.2	27.4	28.5	19.0 (1954)	33.4 (1951)
National spread index	40.0	47.6	49.2	38.4 (1954)	54.6 (1951)
SW Oregon (June 1-Oct. 31):					
Region 6 burning index	26.0	27.8	27.2	17.2 (1953)	35.0 (1960)
National spread index	45.4	44.3	46.3	35.8 (1953)	53.8 (1960)
Central Oregon (May 1-Oct. 31):					
Region 6 burning index	32.1	36.3	33.9	25.3 (1957)	44.5 (1949)
National spread index	49.1	53.6	51.2	45.0 (1957)	61.4 (1949)
NE Oregon (July 1-Oct. 31):					
Region 6 burning index	32.4	29.2	34.9	29.2 (1948) (1962)	41.0 (1959)
National spread index	49.1	45.1	50.8	45.1 (1962)	55.5 (1956)

^{1/} Indexes based on averages of the 1500 P s t observation on the highest 50-percent days for the following stations.

SW Washington	SW Oregon	NW Oregon	Central Oregon	NE Oregon
Seattle-Tacoma	Sexton Summit	Portland	Redmond	Pendleton
Stampede Pass	Medford	Eugene		Meacham
Toledo				

^{2/} Period of record all stations 1948-63

^{3/} Lowest of record

Table 3.--Number of days with lightning storms on the National Forests between July 1 and September 15, 1963, compared with previous years^{1/}

Section	Cur- rent year (1963)	Pre- vious year (1962)	10-year average (1953-62)	Record to 1963 ^{2/}	
				Low	High
Western Washington:					
Average of Olympic, Mt. Baker, Gifford Pinchot and Snoqualmie	^{3/} 19.2	6.2	6.9	2.5 (1954)	11.0 (1956)
Western Oregon:					
Average of Siuslaw, Mt. Hood, Willamette, Umpqua, Rogue, and Siskiyou	14.7	2.7	7.0	1.5 (1954)	15.8 (1956)
East-central Washington:					
Average of Okanogan and Wenatchee	^{3/} 33.0	21.5	13.2	2.0 (1959)	25.5 (1956)
Northeastern Oregon:					
Average of Umatilla, Ochoco, Wallowa-Whitman, and Malheur	26.2	20.2	18.9	7.8 (1959)	28.8 (1960)
South-central Oregon ^{4/} :					
Average of Deschutes, Fremont, and Winema	20.3	9.2	14.3	6.5 (1954)	22.5 (1956)

^{1/} Based on daily reports to U.S. Weather Bureau and on Ranger District field records (R6-5120-49).

^{2/} Period of record 1950-63.

^{3/} New high record.

^{4/} Based on average of Deschutes and Fremont prior to 1961.

Table 4.--Sources of data for rainfall indexes

Section and station	Elevation in feet	Agency	Data used for		Period of computed record
			BI	Rainfall indexes	
Western Washington:					
Bellingham	150	FAA	no	yes	Burning index
Seattle-Tacoma Arpt.	400	Wea. Bur.	yes	no	1948-63. Rain-
Toledo	351	FAA	yes	yes	fall indexes
Stampede Pass	3,958	Wea. Bur.	yes	no	1936-63.
Hoquiam	14	FAA	no	yes	
Western Oregon:					
Portland	21	Wea. Bur.	yes	yes	Burning index
Eugene	361	Wea. Bur.	yes	yes	1948-63. Rain
Sexton Summit	3,836	Wea. Bur.	yes	no	indexes 1922-63
Medford	1,312	Wea. Bur.	yes	yes	except 1923 and
North Bend	11	FAA	no	yes	1927.
East-central Washington:					
Yakima	1,061	Wea. Bur.	no	yes	Burning index
Omak	1,228	Wea. Bur.	no	yes	not computed.
Northeastern Oregon:					
Pendleton	1,492	Wea. Bur.	yes	yes	Burning index
Meacham	4,050	Wea. Bur.	yes	no	computed 1948-63.
Redmond	3,075	FAA	yes	yes	Rain indexes
Burns	4,140	Wea. Bur.	no	yes	1939-63.
South-central Oregon:					
Redmond	3,075	FAA	yes	yes	Burning index
Klamath Falls	4,098	Air Force	no	yes	computed for
Lakeview	4,774	Wea. Bur.	no	yes	1948-63. Rain
					indexes 1949-63.



